1. (Currently Amended) An apparatus comprising:

~~at least one~~ first arrangement providing ~~at least one~~ first electro-magnetic radiation to a sample and ~~at least one~~ second electro-magnetic radiation to a non-reflective reference, wherein a frequency of radiation provided by the ~~at least one~~ first arrangement varies over time; and

~~at least one~~ second arrangement detecting an interference between ~~at least one~~ third radiation associated with the ~~at least one~~ first radiation and ~~at least one~~ fourth radiation associated with the ~~at least one~~ second radiation.

2. (Currently Amended) The apparatus according to claim 1, wherein the ~~at least one~~ third radiation is a radiation returned from the sample, and the ~~at least one~~ fourth radiation is a radiation returned from the reference.

3. (Currently Amended) The apparatus according to claim 1, further comprising ~~at least one~~ third arrangement configured to shift the frequency of at least one of the ~~at least one~~ first electro-magnetic radiation, the ~~at least one~~ second electromagnetic radiation, the ~~at least one~~ third electro-magnetic radiation or the ~~at least one~~ fourth electro-magnetic radiation, and further configured to at least partially reduce, differentiate or eliminate negative frequency components of the interference.

4. (Currently Amended) The apparatus according to claim 1, further comprising ~~at least~~ one third arrangement configured to generate ~~generating~~ an image based on the detected interference.

5. (Currently Amended) The apparatus according to claim 4, further comprising a probe which is configured to scans a transverse location of the sample to generate scanning data, and ~~which~~ provides the scanning data to the third arrangement so as to generate the image.

6. (Original) The apparatus according to claim 5, wherein the scanning data includes the detected interference obtained at multiple transverse locations on the sample.

7. (Currently Amended) The apparatus according to claim 1, wherein the ~~at least one~~ second arrangement comprises ~~at least one~~ photodetector and at least one electrical analog filter which follows the ~~at least one~~ photodetector.

8. (Currently Amended) The apparatus according to claim 3, wherein the ~~at least one~~ second arrangement comprises ~~at least one~~ photodetector and at least one electrical analog filter which follows the ~~at least one~~ photodetector.

9. (Currently Amended) The apparatus according to claim 8, wherein the ~~at least one~~ electric analog filter is a bandpass filter having a center frequency that is approximately the same as a magnitude of the frequency shift by the frequency shifting third arrangement.

10. (Previously Presented) The apparatus according to claim 9, wherein a transmission profile of the at least one electrical analog filter varies substantially over its passband.

11. (Original) The apparatus according to claim 5, wherein the probe comprises a rotary junction and a fiber-optic catheter.

12. (Original) The apparatus according to claim 11, wherein the catheter is rotated at a speed higher than 30 revolutions per second.

13. (Currently Amended) The apparatus according to claim 1, further comprising ~~at least one~~ polarization modulator which is configured to modulate a polarization of the electro-magnetic radiation over time.

14. (Currently Amended) The apparatus according to claim 13, wherein the ~~at least one~~ second arrangement is capable of detecting a polarization state of at least one of the first electro-magnetic radiation or the ~~and~~ second electro-magnetic radiation.

15. (Currently Amended) The apparatus according to claim 1, wherein the ~~at least one~~ second arrangement comprises ~~at least one dual~~ balanced receiver which is configured to remove an auto-correlation associated with the ~~at least one~~ third radiation.

16. (Currently Amended) The apparatus according to claim 1, wherein the ~~at least one~~ second arrangement comprises ~~at least one~~ polarization diverse receiver.

17. (Currently Amended) The apparatus according to claim 1, wherein the ~~at least one~~ second arrangement comprises ~~at least one~~ polarization diverse and dual balanced receiver which is configured to remove an auto-correlation associated with the ~~at least one~~ third radiation.

18. (Currently Amended) The apparatus according to claim 1, further comprising ~~at least one~~ third arrangement which is specifically configured to track the phase difference between at least one of:

- ~~the at least one~~ first electromagnetic radiation and the ~~at least one~~ second electromagnetic radiation, or
- the ~~at least one~~ third electromagnetic radiation and the ~~at least one~~ fourth electromagnetic radiation.

19. (Currently Amended) The apparatus according to claim 1, further comprising an arrangement configured to emitting a particular radiation which is provided to the ~~at least one~~ first arrangement when the ~~at least one~~ first arrangement provides the first and second electro-magnetic radiations based on the particular radiation, wherein at least one of the first and second electro-magnetic radiations has a spectrum whose mean frequency changes substantially continuously over time at a tuning speed that is greater than 100 Tera Hertz per millisecond.

20. (Currently Amended) A method comprising the steps of:

providing ~~at least one~~ first electro-magnetic radiation to a sample and ~~at least one~~ second electro-magnetic radiation to a non-reflective reference, wherein a frequency of the at least one of the first electro-magnetic radiation or the ~~and~~ second electro-magnetic radiations varies over time; and

detecting an interference between ~~at least one~~ third radiation associated with the ~~at least one~~ first radiation and ~~at least one~~ fourth radiation associated with the ~~at least one~~ second radiation.

21. (Currently Amended) An apparatus comprising:

~~at least one~~ first arrangement providing ~~at least one~~ first electro-magnetic radiation to a sample and ~~at least one~~ second electro-magnetic radiation to a reference, wherein at least one of the first electro-magnetic radiation or the ~~and~~ second electro-magnetic radiations has a spectrum which changes over time, the spectrum containing multiple differing longitudinal modes; and

~~at least one~~ second arrangement detecting an interference between ~~at least one~~ third radiation associated with the ~~at least one~~ first radiation and ~~at least one~~ fourth radiation associated with the ~~at least one~~ second radiation.

22. (Currently Amended) The apparatus according to claim 21, wherein the ~~at least one~~ third radiation is a radiation returned from the sample, and the ~~at least one~~ fourth radiation is a radiation returned from the reference.

23. (Currently Amended) The apparatus according to claim 21, further comprising ~~at least one~~ third arrangement configured to shift the frequency of at least one of the ~~at least one~~ first electro-magnetic radiation, the ~~at least one~~ second electromagnetic radiation, the ~~at least one~~ third electro-magnetic radiation or the ~~at least one~~ fourth electro-magnetic radiation, and further configured to at least partially reduce, differentiate or eliminate negative frequency components of the interference.

24. (Currently Amended) The apparatus according to claim 21, further comprising ~~at least one~~ third arrangement generating an image based on the detected interference.

25. (Original) The apparatus according to claim 24, further comprising a probe which scans a transverse location of the sample to generate scanning data, and which provides the scanning data to the third arrangement so as to generate the image.

26. (Original) The apparatus according to claim 25, wherein the scanning data includes the detected interference obtained at multiple transverse locations on the sample.

27. (Original) The apparatus according to claim 21, wherein the reference is non-reflective.

28. (Original) The apparatus according to claim 21, wherein a median of the spectrum varies substantially linearly over time.

29. (Original) The apparatus according to claim 28, wherein a rate of change of the median of the spectrum is at least 1000 nm/msec.

30. (Original) The apparatus according to claim 21, wherein the spectrum change over time repetitively with a repetition rate of at least 10 kHz.

31. (Original) The apparatus according to claim 21, wherein the at least one first arrangement includes a spectral filter to vary the spectrum over time.

32. (Currently Amended) The apparatus according to claim 31, wherein the spectral filter includes a polygon scanner, a spectral separating arrangement that vary the spectrum over time, and an ~~at least one~~ optical imaging arrangement which is configured to directly receive from the spectral separating arrangement one or more components of the interference, and converge and project the one or more components of the interference onto an image plane.

33. (Currently Amended) The apparatus according to claim 21, wherein the ~~at least one~~ first arrangement includes a semiconductor gain medium configured to at least one of generate or amplify ~~generating and amplifying~~ an electro-magnetic radiation.

34. (Currently Amended) The apparatus according to claim 23, wherein the ~~at least one~~ second arrangement comprises ~~at least one~~ photodetector and at least one electrical analog filter which follows the ~~at least one~~ photodetector.

35. (Previously Presented) The apparatus according to claim 34, wherein the at least one electric analog filter is a bandpass filter having a center frequency that is approximately the same as a magnitude of the frequency shift by the frequency shifting arrangement.

36. (Previously Presented) The apparatus according to claim 35, wherein a transmission profile of the electrical analog filter varies substantially over its passband.

37. (Original) The apparatus according to claim 25, wherein the probe comprises a rotary junction and a fiber-optic catheter.

38. (Original) The apparatus according to claim 37, wherein the catheter is rotated at a speed higher than 30 revolutions per second.

39. (Currently Amended) The apparatus according to claim 21, further comprising ~~at least one~~ polarization modulator which is configured to modulate a polarization of the electro-magnetic radiation over time.

40. (Currently Amended) The apparatus according to claim 39, wherein the ~~at least one~~ second arrangement is capable of detecting a polarization state of at least one of the first electro-magnetic radiation or the ~~and~~ second electro-magnetic radiation.

41. (Currently Amended) The apparatus according to claim 21, wherein the ~~at least one~~ second arrangement comprises ~~at least one~~ dual balanced receiver which is configured to remove an auto-correlation associated with the ~~at least one~~ third radiation.

42. (Currently Amended) The apparatus according to claim 21, wherein the ~~at least one~~ second arrangement comprises ~~at least one~~ polarization diverse receiver.

43. (Currently Amended) The apparatus according to claim 21, wherein the ~~at least one~~ second arrangement comprises ~~at least one~~ polarization diverse and dual balanced receiver which is configured to remove an auto-correlation associated with the ~~at least one~~ third radiation.

44. (Currently Amended) The apparatus according to claim 21, further comprising at ~~least one~~ third arrangement which is specifically configured to track the phase difference between at least one of:

- the ~~at least one~~ first electromagnetic radiation and the ~~at least one~~ second electromagnetic radiation, or
- the ~~at least one~~ third electromagnetic radiation and the ~~at least one~~ fourth electromagnetic radiation.

45. (Currently Amended) A method comprising:

providing ~~at least one~~ first electro-magnetic radiation to a sample and ~~at least one~~ second electro-magnetic radiation to a reference, wherein at least one of the first electro-

magnetic radiation or the ~~and~~ second electro-magnetic radiation has a spectrum which changes over time, the spectrum containing multiple differing longitudinal modes; and

detecting an interference between ~~at least one~~ third radiation associated with ~~the at least one~~ first radiation and ~~at least one~~ fourth radiation associated with the ~~at least one~~ second radiation.

46. (Currently Amended) An apparatus comprising:

~~at least one~~ first arrangement providing ~~at least one~~ first electro-magnetic radiation to a sample and ~~at least one~~ second electro-magnetic radiation to a reference, wherein a frequency of radiation provided by the ~~at least one~~ first arrangement varies over time;

~~at least one~~ polarization modulator arrangement which is configured to modulate a polarization of at least one of the ~~at least one~~ first electro-magnetic radiation or the ~~at least one~~ second electro-magnetic radiation over time;

~~at least one~~ second arrangement detecting a first interference signal between ~~at least one~~ third radiation associated with the ~~at least one~~ first radiation and ~~at least one~~ fourth radiation associated with the ~~at least one~~ second radiation in a first polarization state; and

~~at least one~~ third arrangement detecting a second interference signal between the third and fourth electro-magnetic radiations in a second polarization state, wherein the first and second polarization states being different from one another.

47. (Currently Amended) The apparatus according to claim 46, wherein the ~~at least one~~ third radiation is a radiation returned from the sample, and the ~~at least one~~ fourth radiation is a radiation returned from the reference.

48. (Currently Amended) The apparatus according to claim 46, further comprising ~~at least one~~ fourth arrangement configured to shift the frequency of at least one of the ~~at least one~~ first electro-magnetic radiation, the ~~at least one~~ second electromagnetic radiation, the ~~at least one~~ third electro-magnetic radiation or ~~and~~ the ~~at least one~~ fourth electro-magnetic radiation.

49. (Currently Amended) The apparatus according to claim 46, further comprising ~~at least one~~ fourth arrangement generating an image based on the detected interference.

50. (Original) The apparatus according to claim 49, further comprising a probe which scans a transverse location of the sample to generate scanning data, and which provides the scanning data to the fourth arrangement so as to generate the image.

51. (Original) The apparatus according to claim 50, wherein the scanning data includes the detected interference obtained at multiple transverse locations on the sample.

52. (Original) The apparatus according to claim 46, wherein the reference is non-reflective.

53. (Original) The apparatus according to claim 46, wherein a median of the spectrum varies substantially linearly over time.

54. (Currently Amended) The apparatus according to claim 46, wherein the ~~at least one~~ first arrangement includes a spectral filter to vary the spectrum over time.

55. (Previously Presented) The apparatus according to claim 54, wherein the spectral filter includes a polygon scanner, a spectral separating arrangement that vary the spectrum over time, and at least one optical imaging arrangement which is configured to directly receive from the spectral separating arrangement one or more components of the interference, and converge and project the one or more components of the interference onto an image plane.

56. (Currently Amended) The apparatus according to claim 46, wherein the ~~at least one~~ first arrangement includes a semiconductor gain medium configured to at least one of generate or amplify ~~generating and amplifying~~ an electro-magnetic radiation.

57. (Currently Amended) The apparatus according to claim 46, further comprising ~~at least one~~ fourth arrangement generating an image based on the detected interference, wherein the first and second polarization states are approximately orthogonal to one another.

58. (Currently Amended) The apparatus according to claim 48, wherein the ~~at least one~~ second arrangement comprises ~~at least one~~ photodetector and at least one electrical analog filter which follows the ~~at least one~~ photodetector.

59. (Currently Amended) The apparatus according to claim 58, wherein the ~~at least one~~ electric analog filter is a bandpass filter having a center frequency that is approximately the same as a magnitude of the frequency shift by the frequency shifting arrangement.

60. (Previously Presented) The apparatus according to claim 59, wherein a transmission profile of the electrical analog filter varies substantially over its passband.

61. (Original) The apparatus according to claim 50, wherein the probe comprises a rotary junction and a fiber-optic catheter.

62. (Previously Presented) The apparatus according to claim 61, wherein the catheter is rotated at a speed higher than 30 revolutions per second.

Claim 63 (Cancelled).

64. (Currently Amended) The apparatus according to claim 46, wherein the ~~at least one~~ second arrangement is configured to detect a polarization state of at least one of the first electro-magnetic radiation or the ~~and~~ second electro-magnetic radiation.

65. (Currently Amended) The apparatus according to claim 46, wherein the ~~at least one~~ second arrangement comprises ~~at least one~~ dual balanced receiver.

66. (Currently Amended) The apparatus according to claim 46, wherein the ~~at least one~~ second arrangement comprises ~~at least one~~ polarization diverse receiver.

67. (Currently Amended) The apparatus according to claim 46, wherein the ~~at least one~~ second arrangement comprises ~~at least one~~ polarization diverse and dual balanced receiver.

68. (Currently Amended) The apparatus according to claim 46, further comprising at ~~least one~~ third arrangement which is specifically configured to track the phase difference between at least one of:

- the ~~at least one~~ first electromagnetic radiation and the ~~at least one~~ second electromagnetic radiation, or
- the ~~at least one~~ third electromagnetic radiation and the ~~at least one~~ fourth electromagnetic radiation.

69. (Currently Amended) A method comprising:

providing ~~at least one~~ first electro-magnetic radiation to a sample and ~~at least one~~ second electro-magnetic radiation to a reference, wherein a frequency of the at least one of the first electro-magnetic radiation or the ~~and~~ second electro-magnetic radiations varies over time;

modulating a polarization of at least one of the ~~at least one~~ first electro-magnetic radiation or the ~~at least one~~ second electro-magnetic radiation over time;

detecting a first interference signal between ~~at least one~~ third radiation associated with the ~~at least one~~ first radiation and ~~at least one~~ fourth radiation associated with the ~~at least one~~ second radiation in a first polarization state; and

detecting a second interference signal between the third and fourth electro-magnetic radiations in a second polarization state, wherein the first and second polarization states being different from one another.

70. (Currently Amended) The method according to claim 69, wherein the ~~at least one~~ third radiation is a radiation returned from the sample, and the ~~at least one~~ fourth radiation is a radiation returned from the reference.

71. (Currently Amended) An apparatus comprising:

~~at least one~~ first arrangement providing ~~at least one~~ first electro-magnetic radiation to a sample and ~~at least one~~ second electro-magnetic radiation to a reference, wherein at least one of the first electro-magnetic radiation or the second electro-magnetic radiation has a spectrum whose mean frequency changes substantially continuously over time at a tuning speed that is greater than 100 Tera Hertz per millisecond; and

~~at least one~~ second arrangement detecting an interference between ~~at least one~~ third radiation associated with the ~~at least one~~ first radiation and ~~at least one~~ fourth radiation associated with the ~~at least one~~ second radiation.

72. (Original) The apparatus according to claim 71, wherein the mean frequency changes repeatedly at a repetition rate that is greater than 5 kilo Hertz.

73. (Original) The apparatus according to claim 71, wherein the mean frequency changes over a range that is greater than 10 Tera Hertz.

74. (Original) The apparatus according to claim 71, wherein the spectrum has an instantaneous line width that is smaller than 100 Giga Hertz.

75. (Original) The apparatus according to claim 71, further comprising a laser cavity with a roundtrip length shorter than 5 m.

76. (Original) The apparatus according to claim 73, the center of the tuning range of the spectrum is nominally centered at 1300 nm.

77. (Original) The apparatus according to claim 73, the center of the tuning range of the spectrum is nominally centered at 850 nm.

78. (Currently Amended) The apparatus according to claim 73, wherein the center of the tuning range of the spectrum is nominally centered at 1700 nm.

79. (Currently Amended) A method comprising:

providing ~~at least one~~ first electro-magnetic radiation to a sample and ~~at least one~~ second electro-magnetic radiation to a reference, wherein at least one of the first electro-magnetic radiation or the second electro-magnetic radiation has a spectrum whose mean frequency changes substantially continuously over time at a tuning speed that is greater than 100 Tera Hertz per millisecond; and

detecting an interference between at least one third radiation associated with the ~~at least one~~ first radiation and ~~at least one~~ fourth radiation associated with the ~~at least one~~ second radiation.

80. (Currently Amended) An apparatus comprising:

~~at least one~~ first arrangement configured to provide ~~providing~~ ~~at least one~~ first electro-magnetic radiation to a sample and ~~at least one~~ second electro-magnetic radiation to a reference, wherein a frequency of at least one of the first electromagnetic radiation or the second electromagnetic radiations provided by the ~~at least one~~ first arrangement varies over time;

~~at least one~~ second arrangement configured to shift the frequency of at least one of the at least one first electro-magnetic radiation or the at least one second electromagnetic radiation and further configured to at least partially reduce, differentiate or eliminate negative frequency components of the interference;

an interferometer interfering the first and second electro-magnetic radiations to produce an interference signal; and

~~at least one second~~ third arrangement configured to detecting the interference between the first and second electro-magnetic radiations.

Claims 81-95 (Cancelled).

96. (Previously Presented) The apparatus according to claim 21, wherein the spectrum contains multiple differing longitudinal modes at any one time.

97. (Previously Presented) The method according to claim 45, wherein the spectrum contains multiple differing longitudinal modes at any one time.

98. (Previously Presented) The apparatus according to claim 71, wherein the reference is a non-reflective reference.

99. (Previously Presented) The apparatus according to claim 71, wherein the spectrum contains multiple differing longitudinal modes.

100. (Currently Amended) The apparatus according to claim 71, further comprising ~~at least one~~ polarization modulator arrangement which is configured to modulate a polarization of at least one of the ~~at least one~~ first electro-magnetic radiation or the ~~at least one~~ second electro-magnetic radiation over time.

101. (Currently Amended) The apparatus according to claim 71, further comprising ~~at least one~~ third arrangement configured to shift the frequency of at least one of the ~~at least one~~ first electro-magnetic radiation, the ~~at least one~~ second electromagnetic radiation, the ~~at least one~~ third electro-magnetic radiation or the ~~at least one~~ fourth electro-magnetic radiation, and further configured to at least partially reduce, differentiate or eliminate negative frequency components of the interference.

102. (Currently Amended) The apparatus according to claim 71, wherein the ~~at least one~~ second arrangement comprises ~~at least one~~ photodetector and at least one electrical analog filter which follows the ~~at least one~~ photodetector.

103. (Currently Amended) The apparatus according to claim 101, wherein the ~~at least one~~ second arrangement comprises ~~at least one~~ photodetector and at least one electrical analog filter which follows the ~~at least one~~ photodetector.

104. (Currently Amended) The apparatus according to claim 71, further comprising:

~~at least one~~ third arrangement generating an image based on the detected interference; and

a probe which scans a transverse location of the sample to generate scanning data, and which provides the scanning data to the third arrangement so as to generate the image.

105. (Previously Presented) The apparatus according to claim 104, wherein the scanning data includes the detected interference obtained at multiple transverse locations on the sample.

106. (Previously Presented) The apparatus according to claim 104, wherein the probe comprises a rotary junction and a fiber-optic catheter, and wherein the catheter is rotated at a speed higher than 30 revolutions per second.

Claim 107 (Cancelled).

108. (Currently Amended) The apparatus according to claim 71, wherein the ~~at least one~~ second arrangement comprises ~~at least one~~ dual balanced receiver which is configured to remove an auto-correlation associated with the ~~at least one~~ third radiation.

109. (Currently Amended) The apparatus according to claim 71, further comprising ~~at least one~~ third arrangement which is specifically configured to track the phase difference between at least one of:

- the ~~at least one~~ first electromagnetic radiation and the ~~at least one~~ second electromagnetic radiation, or
- the ~~at least one~~ third electromagnetic radiation and the ~~at least one~~ fourth electromagnetic radiation.

110. (Previously Presented) The apparatus according to claim 71, wherein a median of the spectrum varies substantially linearly over time, and wherein a rate of change of the median of the spectrum is at least 1000 nm/msec.

111. (Previously Presented) The apparatus according to claim 71, wherein the spectrum change over time repetitively with a repetition rate of at least 10 kHz.

112. (Currently Amended) The apparatus according to claim 71, wherein the ~~at least one~~ first arrangement includes a spectral filter to vary the spectrum over time, and wherein the spectral filter includes a polygon scanner, a spectral separating arrangement that vary the spectrum over time, and an ~~at least one~~ optical imaging arrangement which is configured to directly receive from the spectral separating arrangement one or more components of the interference, and converge and project the one or more components of the interference onto an image plane.